# DESCRIPTION OF A SECOND SPECIES OF *GNATHOTHLIBUS* WALLENGREN (LEPIDOPTERA: SPHINGIDAE) FROM AUSTRALIA

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## Abstract

*Gnathothlibus australiensis* sp. n. is described and figured from Torres Strait, eastern Queensland and the Northern Territory, Australia. Characters are provided to distinguish it from the sympatric *G. erotus* (Cramer) and the allied *G. vanuatuensis* Lachlan & Moulds.

## Introduction

Only one species of *Gnathothlibus* Wallengren, *G. erotus eras* (Boisduval), has been recorded previously from the Australian mainland. D'Abrera (1987) recorded it from Australia eastwards to Tahiti. An undescribed species, similar to but clearly different in the males from *G. erotus* (Cramer), has been collected on Dauan Island in northern Torres Strait and in small numbers along the Queensland coast from Cape York south to Julatten, 60 km NW of Cairns. A single male is known also from Cooloola, near Gympie in SE Qld. Two males have been collected in the Northern Territory, one from Darwin and one from Oenpelli, 240 km to the east. The only specimen thought to be the possible female of this new species is from Brisbane. Placement of this new species in *Gnathothlibus* complies with the wing colouration and the generic diagnosis given by D'Abrera (1987).

### *Gnathothlibus australiensis* sp. n.

(Figs 1-3, 8)

*Types. Holotype* ♂, QUEENSLAND: Lizard Island, 93 km NNE of Cooktown, Nth Qld, 6.xii.2002, R.B. Lachlan (in Australian National Insect Collection, CSIRO, Canberra [ANIC]). *Paratypes*: 1 ♂, Dauan Is, 9 km S of PNG, 9°25'S, 142°32'E, Torres Strait, 19.i.2004, A.I. Knight; 1 ♂, upper Jardine River, Cape York Pen., N. Qld, 11°19'S, 142°37'E, 22.x.1979, M.S. & B.J. Moulds; 1 ♂, upper Jardine River, Cape York Pen., N. Qld, 11°17'S, 142°35'E, 23.x.1979, M.S. & B.J. Moulds; 1 ♂, Jardine River, Cape York Pen., N. Qld, 11°08'S, 142°29'E, M.S. & B.J. Moulds; 3 ♂♂, 11°13'S, 142°23'E, Bridge Creek (Cape York), 19.xi.1992, at light, A. Calder, P. Zborowski; 1 ♂, 11°41'S, 142°42'E, 14 km ENE Heathlands, Qld, 21.xi.1992, at light, rainforest, P. Zborowski & A. Calder, ANIC genitalia slide 18520; 1 ♂, 11°58'S, 142°55'E, Harmer Creek, Qld, 22.v.1993, at light, riverine forest, P. Zborowski; 1 ♂, Cape York Pen., N.Q., Iron Range, 15.ix.1974, A. & M. Walford-Huggins; 4 ♂♂, Iron Range, N. Qld, 2, 12.v.1975 & 2, 3.vi.1975, M.S. Moulds; 1 ♂, old Lockhart River Mission, Cape York Pen., N. Qld, 24x.1974, M.S. Moulds; 1 ♂, Lizard Island, 93 km NNE of Cooktown, Nth Qld, 13.xii.2002, R.B. Lachlan; 1 ♂, Cooktown, 25.iv.1922 (Qld Museum, Reg. No. T 99173); 1 ♂, Julatten, near foothills of Mt Lewis, N. Qld, .iii.1986, Hans Beste; 2 ♂♂, Julatten, N. Qld, 14.xi.1979, M.S. & B.J. Moulds; 1 ♂, 'Camp Milo', Cooloola, S.E.Q., E. Dahms, 3-13.iii.1970 (Qld Museum, Reg. No. T 99174). NORTHERN TERRITORY: *Paratypes*: 1 ♂, Darwin, N.T., 14.vi.1969, J.C. Le Souef; 1 ♂, 12°17'S, 133°13'E, Birraduk Creek, 18 km NE

Oenpelli, N.T., 1.vi.1973, E.D. Edwards & M.S. Upton. (In ANIC, Queensland Museum, Australian Museum, M. Moulds and RBL collections).

*Other material examined.* QUEENSLAND: 1 ♀, St. John's Wood, Brisbane, S.E.Q., x.1958, S. Deller (in Queensland Museum).

*Description.* Male (Figs 1-3). Antennae creamy-brown above, brown below; palpi pinkish-brown above, contrasting white below; dorsal surface of head and thorax uniform medium brown, abdomen slightly lighter brown; small dark median spot on prothorax; thin lateral creamy-white stripe from base of antenna to posterior of tegula. Thorax ventrally with whitish patch immediately posterior to palpi, remainder light creamy-brown. Ventral area of abdomen light pinkish-brown, with three or four lateral tiny black spots surrounded by white. Fore tibiae covered in cream hair scales tinged with pink distally; fore tarsi cream without long hair scales. Mid and hind tibiae with cream hair scales, mid and hind tarsi cream with pinkish-brown distally.

Forewing upperside as in Fig. 1. Forewing length 33-38 mm, mean 35.7 mm (n = 18). Ground colour brown (darker in fresh specimens) with faint, darker markings; unicolorous in overall appearance in most specimens examined; small black stigma with lighter centre barely visible at end of discal cell; a narrow, inwardly oblique post median band runs from costa, where it is curved distally, to inner margin; all other markings barely visible. Forewing underside as in Fig. 2; basal half yellow-brown without markings; distal half with brown ground colour lightly speckled with dark brown. Hindwing upperside as in Fig. 1; ground colour orange; a slightly variable thin dark brown terminal band from apex to tornus, thinnest at apex; little or no brown scaling from inner margin of dark brown band basally along veins $R_s$ to $CuA_2$. Hindwing underside as in Fig. 2; ground colour light orange-brown; heavily speckled with dark brown; orange-brown tornal patch between veins 1A+2A and 3A.

Male genitalia (Fig. 8). Uncus in lateral view longish, slender, parallel sided, clearly arched, distally enlarged with small dark pointed ventral tooth and small pointed dorsal crest, distal vertical margin generally straightish; gnathos in lateral view thin, straight, gradually tapering to a small, slightly upturned point, in dorsal view gnathos is wide basally with a very slight incurve at attachment point to tegumen, distally tapering to a rounded point with straightish sides; valva slightly convex at ventral margin, dorsal margin tending straight then slightly convex, distally rounded; sacculus process robust, distal end dark, tapering to a thin, upturned sharp point, ventral margin straightish basally; aedeagus in lateral view with distal end dark, tapered to a short, small rounded apex with dorsal backward directed barb, with a smaller ventral barb a little proximad of dorsal barb.

Female. Not known with certainty. A specimen which may belong here is illustrated in Figs 6-7.

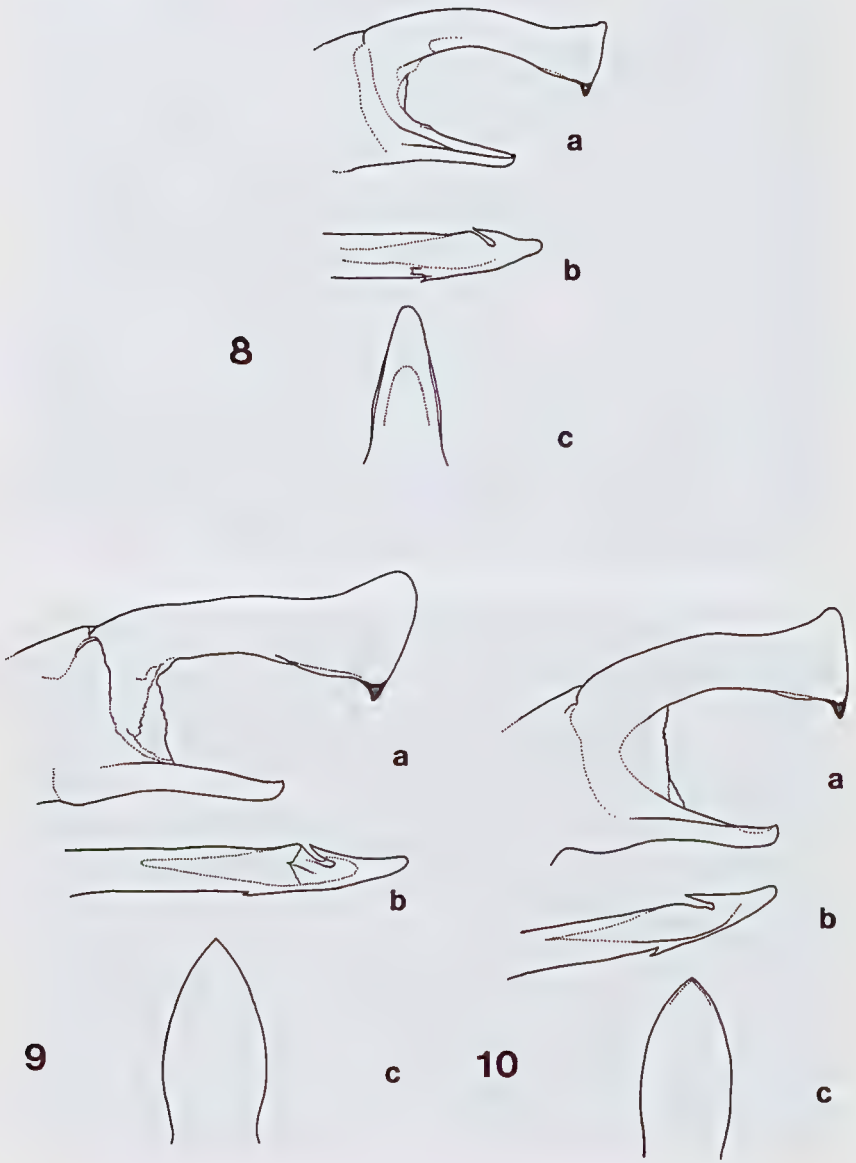

**Figs 1-2.** *Gnathothlibus australiensis*, holotype male. (1) upperside; (2) underside.



**Figs 3-5.** *Gnathothlibus* spp., males. (3) *G. australiensis* holotype, fore tarsi and tibia. (4-5) *G. vanuatuensis* holotype: (4) upperside; (5) underside.



**Figs 6-7.** *Gnathothlibus* sp., possible *G. australiensis* female. (6) upperside; (7) underside.




**Figs 8-10.** *Gnathothlibus* spp., male genitalia: a, uncus and gnathos (lateral view); b, aedeagus (lateral view); c, gnathos (dorsal view). (8) *G. australiensis*; (9) *G. erotus eras*; (10) *G. vanuatuensis*.

*Etymology*. The specific name *australiensis* has been chosen to indicate the provenance (Australia) of all known specimens.

**Discussion**

*Gnathothlibus australiensis* most closely resembles the common and sympatric *G. erotus eras*, which occurs in Australia, Papua New Guinea, Solomon Islands, New Caledonia and parts of the Pacific, and the allopatric *G. vanuatuensis* Lachlan & Moulds (Figs 4-5), known only from Vanuatu (Lachlan and Moulds 2003). *G. australiensis* is readily distinguished from *G. erotus eras* by the complete absence of any long hair scales on the fore tarsi and a clear reduction in length and thickness of the long hair scales covering the fore tibiae in males. These foreleg characters are shared with *G. vanuatuensis*. However, *G. australiensis* is noticeably smaller than both *G. erotus eras* and *G. vanuatuensis*, particularly when compared in series. The mean forewing length of *G. australiensis* is 35.7 mm (n = 18) and ranged from 33-38 mm. In *G. erotus eras* the mean forewing length is 42 mm (n = 50) and ranged from 37-46 mm. In *G. vanuatuensis* the mean forewing length is 40.7 mm (n = 58) and ranged from 37.5-44.3 mm. (Three abnormally small *G. vanuatuensis* specimens, of 32.7, 33.8 and 35.3 mm, were taken at the end of a long dry season in Vanuatu and were not included in the measurements).

The darker forewing markings tend to be less evident in *G. australiensis*, giving a more unicolorous appearance than generally seen in *G. erotus eras*. By contrast, *G. vanuatuensis* is usually strongly marked. The forewing termen tends to be straighter in *G. vanuatuensis* than in both *G. australiensis* and *G. erotus eras*, where it is almost always clearly more convex. On the hindwing upperside of *G. australiensis*, there is very little or no brown scaling from the inner margin of the thin, dark brown terminal band basally along veins $R_s$ to $CuA_2$; brown scaling along these veins is common and extensive in many specimens in *G. erotus eras*. In *G. vanuatuensis* the degree of brown scaling along these veins is variable. The thorax of *G. australiensis* has, ventrally, light creamy-brown pilosity; this is clearly browner in *G. erotus eras* and *G. vanuatuensis*.

The male genitalia of *G. australiensis* (Fig. 8) differ from those of *G. erotus eras* (Fig. 9) in lateral view in having a more arched uncus, distally less enlarged with a more pointed dorsal crest and a slightly smaller, ventral tooth. *G. vanuatuensis* (Fig. 10) differs from *G. australiensis* (Fig. 8) in lateral view in having a slightly shorter, more robust uncus with a more prominent black ventral tooth and less curved posterior dorsal margin on the uncus; this posterior dorsal margin is evenly curved in *G. australiensis*. In lateral view the gnathos distal point is less upturned than in *G. erotus eras* and *G. vanuatuensis*. In dorsal view there is only a small incurve on each side at attachment point to tegumen, the incurve being more distinct in *G. erotus eras*. The gnathos is narrower and tapers distally to a clearly more rounded point in *G. australiensis* than in *G. erotus eras* or *G. vanuatuensis*. The

sacculus process in *G. australiensis* tends to be slightly more needle-like distally and not so upturned as seen in *G. erotus eras*; its ventral margin is straightish basally, the margin being slightly, but clearly, convex in *G. erotus eras* and *G. vanuatuensis*. In *G. australiensis* the aedeagus, in lateral view, tapers to a clearly shorter apex than seen in either *G. erotus eras* or *G. vanuatuensis*.

It is surprising, given the morphological differences seen in males of *G. australiensis*, that it has not been possible to find with certainty females which are in any way consistently distinct from those of *G. erotus eras*, despite examining large numbers of females from Australia and Papua New Guinea. In Australia, females of *G. erotus eras* tend to be about 1.4 times larger than males. Applying this formula to the known males of *G. australiensis*, it is expected that the mean forewing length of females would be about 41 mm, with a range of 35-46 mm. Only nine small *G. erotus eras* females have been found to fit inside this range, the two smallest having forewing lengths of 36.5 mm (Figs 6-7) and 39.5 mm.

The genitalia were not examined from the specimen illustrated in Figs 6-7 as the abdomen had collapsed inwards. It is, however, the smallest female known to the author and does display the unicolorous, poorly marked forewings normally seen in the males. The genitalia of numerous females of all sizes were examined but, given the closeness of the two species and the individual variation encountered, the only constant difference seen in two of the small specimens was a longer and narrower lamella postvaginalis (Ted Edwards, pers. comm.). More small females will need to be found and dissected, particularly from Cape York Peninsula where all but four of the known males were collected, to see if this character is constant or is only an extreme variation. The biology of *G. australiensis* is unknown.

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## References

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